

CLAIMS

1. An illumination apparatus in which a through-hole for detection is formed at a center portion, and which irradiates diffused light and directional light to an object to be detected, characterized in that at least an annular diffusion plate which diffuses light, light source which were disposed annularly, and an annular reflection plate which reflects light from the light source to the side of said object to be detected, are disposed in the order from the side of said object to be detected, and said diffused light is generated by irradiating light from said light source to the object to be detected through said diffusion plate, and light from said light source is reflected by said reflection plate and then, irradiated to the object to be detected.

2. The illumination apparatus as set forth in patent claim 1, characterized in that the light source comprises two kinds of a light source for diffused light and a light source for directional light, and an annular fixing plate, on which the light source for diffused light was disposed on a surface which becomes the side of said object to be detected and the light source for directional light was disposed on the other surface, was disposed between said diffusion plate and said reflection plate.

3. The illumination apparatus as set forth in patent claim 2, characterized in that the light source for directional light is attached through a flexible elastic pin from said fixing plate.

4. The illumination apparatus as set forth in patent claim 2 or 3, characterized in that an illumination control section, which individually controls the light source for diffused light and the light source for directional light, is provided, and the illumination control section carries out a switch operation for
5 switching over lighting of each light source, and an adjustment operation for changing illumination intensity of each light source.

5. The illumination apparatus as set forth in any one of patent claims 1 through 3, characterized in that said reflection plate is a side end face
10 of an inner surface of the case which provides accommodation for said light source and said diffusion plate.

6. The illumination apparatus as set forth in patent claim 5, characterized that at least a side end face of said case inner surface is of a
15 white color or a metal color.

7. A recognition apparatus characterized by being equipped with the illumination apparatus which was described in any one of patent claims 1 through 6, an image pickup camera which picks up an image of the object to
20 be detected, which was illuminated by the illumination apparatus, and a control section which carries out recognition processing of the object to be detected, by use of the image which was picked up.

8. A component mounting apparatus which has an absorption
25 nozzle, with which a transfer head, which moves on the upper side of a

substrate, was equipped, absorbed and held a component, and transfers said transfer head to mount the component on the substrate at a predetermined position, characterized in that a recognition apparatus which is disposed on said transfer head and detects a mark for alignment which was disposed on
5 said substrate and corrects a mounting position of said component depending on a detection position of the mark for alignment is the recognition apparatus which is described in patent claim 7.

9. A component mounting apparatus which has an absorption
10 nozzle, with which a transfer head, which moves on the upper side of a substrate, was equipped, absorbed and held a component, and transfers said transfer head to mount the component on the substrate at a predetermined position, characterized in that a recognition apparatus which is disposed on the lower side of said transfer head and recognizes a component which was
15 absorbed and held by said absorption nozzle is the recognition apparatus which is described in patent claim 7.